

REMARKS

Claims 1-35 are currently pending in the application; with claims 1 and 18 being independent. Claims 1-35 were pending prior to the Office Action. In this Reply, claims 1, 5-8, 12-18, 22-24 and 29-34 have been amended.

The Examiner is respectfully requested to reconsider the rejections in view of the amendments and remarks set forth herein. Applicants respectfully request favorable consideration thereof in light of the amendments and comments contained herein, and earnestly seek timely allowance of the pending claims.

Claim Objections

The Examiner objected to claims 12 and 29 for improperly reciting the list of various chemicals.

This objection is respectfully traversed. Applicants have amended claim 12 to recite that “said chemicals are coagulants, flocculants, oxidants, reductants, adsorbents, dispersing agents, biocides, defoamers, or combinations thereof.” Claim 29 has been amended in a similar manner.

Accordingly, Applicants respectfully request that the claim objections be reconsidered and withdrawn.

Claim Rejections – 35 USC §112

The Examiner rejected claims 1-35 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

This rejection is respectfully traversed.

The Examiner alleged that various features recited in claim 1 are unclear (page 4 of Office Action). Applicants have addressed Examiner’s concerns by amending claim 1 to recite “controlling the dosing of one or more chemicals to the liquid by said LE controller to output a dosage for said one or more chemicals.” The method of claim 1 as recited herein clearly defines the inputting, modifying and controlling steps and the relationship between the steps.

The Examiner also alleged that it is unclear what is considered feedback or feedforward control in claims 5 and 6. Applicants have amended claim 5 to recite that

“said LE controller includes a feedback controller for determining a change of control of said LE controller based on a difference between an output of said system and a setpoint”

and claim 6 to recite that

“said LE controller includes a feedforward controller for determining the dosing of one or more chemicals to the liquid by compensating for process disturbances in advance.”

The Examiner further alleged that the recitation of “cascade controllers” in claim 7 is unclear. Claim 7 has been amended to recite:

“one or more cascade controllers connected to said LE controller, to improve control by changing one or more treatment process requirements or fitting a set point to one or more process requirements of one or more liquid treatment sub-processes.”

Claim 24 which recites “one or more cascade controllers” has been amended as well.

The Examiner alleged that it is unclear how the liquid is described by the quality index in claim 8 (and claim 9 depending from claim 8). Applicants have amended claim 8 to recite that “one of said properties of the liquid is a quality index of the liquid.”

The Examiner alleged that it is unclear what is considered incoming or outgoing liquid in claims 13, 14, 30 and 31. Applicants have amended claim 13 to recite that “said properties of the liquid are defined from incoming liquid which enters said liquid treatment system”, and claim 14 to recite that “said properties of the liquid are defined from outgoing, treated liquid which exits said liquid treatment system.” Claims 30 and 31 have been amended as well.

The Examiner alleged that the recited “adaptation” in claims 15, 16, 32 and 33 is unclear. Applicants have amended claim 15 to recite that “said predefined adaptation model is a LE-model”, and claim 16 to recite that “said predefined adaptation model is a fuzzy model.” Claims 32 and 33 have also been amended. Claim 32 recites “wherein one of said one or more predefined adaptation subsystems is a LE-model subsystem” and claim 33 recites “wherein one of said one or more predefined adaptation subsystems is a fuzzy model subsystem.”

The Examiner alleged that the “remote operation” recited in claims 17 and 34 is unclear. Applicants have amended claim 17 to recite that

“an adaptation performed by said predefined adaptation model is performed by remote operation, whereby one or more parameters of said adaptation model is/are evaluated and/or updated by a remote processor in connection with a remote data system”

and claim 34 to recite that

“an adaptation process of said one or more predefined adaptation subsystems is performed by remote operation whereby one or more parameters of said one or more adaptation subsystems is/are evaluated and/or updated by a remote processor in connection with a remote data system.”

The Examiner rejected claim 18 because the recited “device arrangement” allegedly includes only one structure. Applicants have amended claim 18 to recite one or more subsystems and a controller, as indicated below:

“A device arrangement for automatic dose control of chemicals in a liquid treatment system, said device arrangement comprising:

one or more predefined adaptation subsystems which inputs properties of a liquid and outputs at least one adaptation coefficient; and

a linguistic equation (LE) controller operatively connected to said one or more predefined adaptation subsystems,

wherein the control surface of the linguistic equation (LE) controller is modified adaptively using the at least one adaptation coefficient, to control the dosing of one or more chemicals to the liquid by said LE controller and output a dosage for said one or more chemicals for said liquid treatment system.”

The Examiner rejected claim 35 because the scope of the term “intelligent” is allegedly unclear. Applicants respectfully disagree and traverse this rejection.

Applicants respectfully submit that the Examiner's focus during examination for compliance with the requirement of definiteness in § 112, second paragraph is whether the claim meets the threshold requirements of clarity and precision. To do this, the Examiner needs only ensure that the claims define the invention with a reasonable degree of particularity and distinctness. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A)The content of the particular application disclosure;
- (B)The teachings of the prior art; and

(C)The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. *See M.P.E.P. § 2173.02.*

The Examiner alleged that the term “intelligent” is indefinite. Applicants respectfully submit that the present specification provides the requisite guidance regarding the feature “intelligent analyzer”. For example, at page 5 lines 11-14 and page 12 lines 34-37 in the specification it is explained that an intelligent analyzer “denotes an implemented software module or device representing measurement handling routines, e.g. indirect measurements, trend analyzers and detection of operating conditions.” Applicants respectfully submit that the present specification provides the requisite guidance regarding the recited intelligent analyzer.

Applicants point out that the test for definiteness under 35 U.S.C. § 112, second paragraph, is whether “those skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). *See M.P.E.P. 2173.02.* Applicants respectfully submit that one of ordinary skill in the art, upon reading the present specification, would understand the scope of “an intelligent analyzer which is an implemented software module or device representing measurement handling routines” recited in claim 35.

As mentioned at *M.P.E.P. 2173.02*, “the requirement to ‘distinctly’ claim means that the claim must have a meaning discernible to one of ordinary skill in the art when construed according to correct principles....Only when a claim remains insolubly ambiguous without a discernible meaning after all reasonable attempts at construction must a court declare it indefinite.” The feature of “an intelligent analyzer which is an implemented software module or device representing measurement handling routines” unambiguously and clearly indicates the claimed subject matter.

Applicants respectfully submit that claim 35 defines the invention with a reasonable degree of particularity and distinctness and clearly defines the metes and bounds of the claimed subject matter.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. §112 rejections of claims 1-35.

Claim Rejections – 35 USC §103

The Examiner rejected claims 1-35 under 35 U.S.C. §103(a) as being made obvious by “Intelligent Methods in Dosing Control of Water Treatment” by Juuso et al., Proceedings of Workshop on Applications in Chemical and Biochemical Industry, 1999, pp.1-8 (herein “Juuso”).

This rejection is respectfully traversed. Applicants respectfully submit the Examiner has failed to establish a *prima facie* case of obviousness.

To establish a *prima facie* case of obviousness, the Examiner has the burden of meeting the basic criterion that the prior art must teach or suggest all of the claim limitations. Regarding this basic criterion, the Applicant submits that Juuso does not disclose or suggest all features of each of the independent claims 1 and 18, as explained below.

Claim 1 recites:

“A method for automatic dose control of one or more chemicals in a liquid treatment system, which comprises:

 inputting properties of a liquid into a predefined adaptation model to output an adaptation coefficient;

 modifying the control surface of a linguistic equation (LE) controller adaptively using the adaptation coefficient; and

 controlling the dosing of one or more chemicals to the liquid by said LE controller to output a dosage for said one or more chemicals.”

Claim 18 recites:

“A device arrangement for automatic dose control of chemicals in a liquid treatment system, said device arrangement comprising:

 one or more predefined adaptation subsystems which inputs properties of a liquid and outputs at least one adaptation coefficient; and

 a linguistic equation (LE) controller operatively connected to said one or more predefined adaptation subsystems,

 wherein the control surface of the linguistic equation (LE) controller is modified adaptively using the at least one adaptation coefficient, to control the dosing of one or more chemicals to the liquid by said LE controller and output a dosage for said one or more chemicals for said liquid treatment system.”

In the Office Action, the Examiner alleges that Juuso discloses an adaptation model in abstract, lines 8-9 (page 9 of Office Action).

Applicants respectfully disagree. In the method recited in claim 1, an adaptation coefficient is calculated and is used for modifying the control surface of a LE controller.

The static model discussed at line 8 of Juuso merely calculates turbidity of the outgoing water and does not disclose any adaptation model or coefficient. In the conclusion of Juuso it is suggested that LE's "provide a feasible basis for adaptive dosing control". This statement does not teach how to carry out in practice adaptation of a controller. Juuso does not disclose a way to carry out adaptation of the controller(s), does not disclose any implementation of the adaptation, and does not contain a pointer to the present solution for chemical dosing control recited in claims 1 and 18 of the present application.

The use of the properties of liquid in dosing control of chemicals in feedback/feedforward basic control, which is shown on page 7 figure 10 of Juuso, is not adaptation. Juuso does not disclose that the properties of water (mentioned therein) could be used in the adaptation of a LE controller. Juuso merely teaches the use of Linguistic Equation technology in the modeling of water purification process. The process model described in Juuso calculates the quality (turbidity) of the outgoing water in the process by the means of input variables (such as flow rate, amount of chemicals etc.) of a model. The model described in Juuso is not an adaptation model and it cannot be used as an adaptation model because the output variable of the process model is totally different from the output of an adaptation model. In other words, the process models and the adaptation models calculate totally different things and the purpose of use thereof is different.

With a process model, the behavior of a process in different process/operating conditions can be studied. The process model can be used as inverted in feedforward control, i.e., for example the chemical doses can be calculated with the inverted process model. However, such application is not an adaptive control, but only a feedforwad basic control.

Thus, Juuso does not disclose all features of claims 1 and 18. Furthermore, it would not be obvious to a person of ordinary skill in the art to implement the method or device arrangement recited in the independent claims of the present application based on Juuso's brief and general reference to adaptive dosing control.

The Examiner recognized that various features recited in the claims are not disclosed or suggested by Juuso, and took Official Notice that such features would have been obvious to one of ordinary skill in the art at the time the invention was made. For example, the Examiner considered that using a fuzzy model as recited in claims 16 and 33, performing remote operation as recited in claims 17 and 34, and using of the chemicals recited in claims 12 and 29 in the method of claim 1 and the device arrangement of claim 18 would have been obvious.

Applicants respectfully object to this reliance on Official Notice and request that the Examiner cite a reference to support the above Officially Noticed facts. MPEP 2144.03. Official Notice is proper only when the officially noticed fact is capable of “instant and unquestionable demonstration as being well-known.” MPEP 2144.03. The above, complex statements are submitted to not be capable of instant and unquestionable demonstration as being well-known. As provided by the MPEP “It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art (emphasis added).” *In re Ahlert*, 165 U.S.P.Q. at 420-21. The use of a fuzzy model for adaptation in the context of control of treatment chemicals in a liquid treatment system is not disclosed or suggested by the prior art. Performing adaptation by remote operation in the context of control of treatment chemicals in a liquid treatment system is also not disclosed or suggested by the prior art. Using of the chemicals recited in claims 12 and 29 with an adaptive method or device arrangement for chemical dosing control is also not taught or suggested by the prior art. For at least these reasons it cannot be said that the above mentioned claimed features of claims 16, 33, 17, 34, 12 and 29 would have been obvious to one of ordinary skill in the art at the time the invention was made. The Examiner has not provided a technical line of reasoning to support reliance on Official Notice. See MPEP 2144.03. Therefore, as provided by MPEP 2144.03, Applicants traverse the Examiner’s reliance on Official Notice and request that the Examiner provide “documentary evidence” in support of these rejections if the rejections are maintained.

The Examiner has not given patentable weight to many limitations in claim 18, as indicated on pages 2-3 of the Office Action.

Applicants point out that when evaluating claims for obviousness under 35 U.S.C. §103, all the limitations of the claims must be considered and given patentable weight.

The one or more predefined adaptation subsystems and the controller recited in claim 18 are specific types of subsystem(s)/controller which are configured in such a way that the use of the one or more predefined adaptation subsystems and controller provides structural elements to the recited device arrangement. The subsystem(s) and controller recited in claim 18 effect structural changes to the device arrangement. The positive recitation of structure including “one or more predefined adaptation subsystems which inputs properties of a liquid and outputs at least one adaptation coefficient” and the “linguistic equation (LE) controller operatively connected to said one or more predefined adaptation subsystems” recited in claim 18, is not functional and affects the structure of the device arrangement being claimed, and must be given patentable weight.

For all of the above reasons, taken alone or in combination, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejections of claims 1 and 18. Claims 2-17 depend from claim 1 and are allowable at least by virtue of their dependency. Claims 19-35 depend from claim 18 and are allowable at least by virtue of their dependency.

CONCLUSION

In view of the above amendments and remarks, this application appears to be in condition for allowance and the Examiner is, therefore, requested to reexamine the application and pass the claims to issue.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Corina E. Tanasa, Registration No. 64,042, at telephone number (703) 208-4003, located in the Washington, DC area, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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